Increasing Uptime Brings Rewards Beyond Profitability

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Quality information is a critical component that is missing from many asset management and maintenance, repair and overhaul (MRO) programs. Information that is incomplete, outdated or wrong hinders asset utilization, leads to equipment breakdowns, prevents the most efficient use of service resources and causes excessive and inefficient spending on equipment repair and replacement.

An investment in tools that provide good information for asset management systems will provide a strong and sustainable return on investment. Organizations can prevent many unnecessary replacement and maintenance expenses by accurately tracking equipment, parts and labor with automated data capture (ADC) and mobile computing systems. Timely, accurate data helps eliminate service oversights and redundancies, enables efficient, preventative maintenance and helps organizations optimize their asset utilization.

Today's service organizations are facing ever greater pressures to increase uptime and productivity while reducing costs. At the same time, organizations are facing greater pressure to find more sustainable ways of doing business.

According to ARC Advisory Group, "Focused "green" solutions are needed that combine the best practices for business improvement while protecting the environment by better managing sustainability, limiting pollutants such as greenhouse gas (GHG) emissions, and reducing consumption of natural resources. Enterprise Asset Management is one area where environmental benefits are possible while also improving asset performance and business operations."[1]

This white paper will show how mobile computing and ADC systems add value to asset management operations and support green initiatives by providing accurate, timely information that results in increased uptime, reduced resource waste and savings in time, labor and capital.

Assets, Information and Profitability

Organizations often don't put the same management and measurement over service and maintenance as they do over other areas of business. For example, it's well understood that excess inventory hurts cash flow and profits. Companies invest heavily in inventory tracking, demand planning, production management and supply chain systems to keep inventory at optimum levels. Optimizing asset utilization, reducing fixed assets and lowering maintenance and service costs also offer tremendous bottom-line benefits, yet assets are seldom managed as carefully as inventory. This business-as-usual approach hurts the business. A passive approach to asset management also puts organizations at risk for business disruption and replacement expenses caused by lost or stolen assets, expensive repairs that regularly scheduled maintenance could have prevented, missed service revenue opportunities and the inefficient use of labor and equipment.

Maintenance programs or enterprise asset management (EAM) software systems are not enough. These approaches rely on information to be collected in the first place, and rely on the information to be accurate. That's why automated data capture systems need to be a part of any asset management or MRO program. ADC systems make it efficient to collect the necessary information, and provide complete, quality data that makes asset and maintenance management programs effective.

Bad Data is Bad Business

There are numerous ways that inaccurate, incomplete or out-of-date information creates unnecessary expenses and productivity losses. For example, suppose a worker servicing a production machine notices a part is beginning to show wear and should be replaced. The worker notes the condition in his service record, which is given to a data entry clerk to record. A supervisor sees the note, approves a replacement part and issues a new work order.

Days or even weeks could pass from the time the worn part is first detected until it is replaced. Passing time increases the likelihood that the machine will fail. Actual failures slow production and could cause orders to be lost, late or require overtime to complete on time. The cost of the failure – and the service delay – greatly exceeds the cost of the replacement part and labor.

Preventive maintenance is nearly always more cost effective than emergency repairs. Consider how the scenario above could have been different if the company had automated maintenance systems in place. The worker notices the worn part. Using a handheld computer, he scans the part's bar code ID label. The part record is then displayed on the computer screen, and the worker can enter a simple service code to record the problem. The maintenance history on screen shows the part is original and is nearing the limit of its recommended service hours. The handheld software application then authorizes the worker to replace it immediately, or wirelessly sends an authorization request to the supervisor. The worker replaces the part, scanning the bar code on the replacement to record its entry into service. This approach improves equipment uptime and asset utilization, prevents expensive breakdowns, and raises worker productivity by improving the "first-time fix" rate.

Predictive versus Preventive Maintenance

While preventive maintenance has many advantages and often provides great improvements in uptime and decreased maintenance costs over the sub-standard 'run it until it breaks' model, it also has disadvantages in terms of costs, time and resource waste. Because preventive maintenance is typically time based instead of condition based it may result in resource waste as a result of unneeded service and doesn't prevent all catastrophic equipment failure.

By comparison, predictive maintenance relies on real data collected from equipment to measure machine condition and performance and schedule service only when it is actually required. Over time, the tracked results and trends can be used to develop a solid condition based maintenance plan. Predictive maintenance, when implemented well, can virtually eliminate catastrophic equipment failures.

1 ARC Solutions Group - Enterprise Asset Management Supports "Green"
Initiatives, INSIGHT# 2008-25E JUNE 20, 2008, www.ARCweb.com

The advantages of a predictive maintenance plan are plain, not only in terms of uptime but also in decreased spare parts inventory costs and staffing levels. Service can be scheduled to minimize or eliminate overtime and downtime costs. Spare parts inventory can be optimized to reduce unneeded inventory and carrying costs. Equipment will operate at the optimal level, resulting in energy savings and increased reliability.

According to the US Department of Energy's Federal Energy Management Program (FEMP), "a properly functioning predictive maintenance program can provide a savings of 8% to 12% over a program utilizing preventive maintenance strategies alone. Depending on a facility's reliance on a reactive maintenance approach and material condition, savings opportunities of 30% to 40% could easily be realized."[2]

According to the FEMP, independent surveys indicate that industrial manufacturing organizations see the following results[2]:

• Return on investment: 10 times
• Reduction in maintenance costs: 25% to 30%
• Elimination of breakdowns: 70% to 75%
• Reduction in downtime: 35% to 45%
• Increase in production: 20% to 25%

In actual implementation, the best maintenance plans combine a balance of preventive and predictive technologies. Some tasks are most easily, and cost effectively, performed on a time schedule because predictive maintenance technology is not available or not cost effective. Other tasks may see significant labor, cost and resource savings with preventive maintenance as they may not need to be performed as often as a time schedule would dictate.

Productivity Gains

Automated systems improve productivity for mobile workers and office personnel alike. Handheld computing applications provide repair history, service notes and instructions that eliminate guesswork. Workers also save time by eliminating pen and paper and recording activity electronically with bar code and RFID reading, and using menus to enter activity codes. Replacing paper-based maintenance procedures with automated systems can improve the first-time fix rate by 30 percent and give technicians 40 percent more "wrench time" according to a study performed by Syclo, a leading mobile maintenance solutions provider. Syclo also found technicians spend an average of 43 minutes per day on paperwork. Reducing this burden with automated systems can improve productivity 18 percent, which is often enough to allow each technician another service call per day.

Connexus Energy, Minnesota's largest electric co-op, received an even stronger productivity boost when it replaced its paper-based substation inspection operations with handheld computers from Intermec and computerized maintenance management software (CMMS). Substation inspections have been completed 43 percent faster since Connexus switched to the mobile system that provides pull-down menus and other shortcuts for data entry. Inspection data is downloaded from the handhelds to the host computer system at the end of each shift for same-day analysis. Automated entry and analysis enables has cut days and sometimes weeks off the time required to generate work orders and dispatch maintenance crews.

The data processing benefits Connexus experienced are just one example of how automated systems bring increased productivity to the office. Inefficient redundancy is built into paper-based systems, which require manual data entry at the job site and again at the office for input into the computer system. These procedures also create two chances for data entry errors. Redundancy and errors were a burden to Raymond Handling Concepts, which services lift trucks for customers. The company has 86 field service technicians who used to generate about 90,000 multipart work orders, service records and other forms annually. Raymond Handling implemented Intermec wireless handheld computers for its technicians to record all activity. Now, the only paper generated is a customer receipt that technicians automatically prepare for customers with their handheld computers and mobile printers.

Technicians use the wide-area wireless radios on their handheld computers to update the host system at headquarters on jobs completed, parts used and invoices issued. There is no longer any manual data entry required at the office, or any end-of-day bottlenecks caused by technicians turning in their paperwork at the same time.

Honeywell implemented a wireless reporting and ADC system for internal maintenance tracking at its aircraft engine overhaul facility in Phoenix, Arizona. Records can now be retrieved 65 to 70 percent faster compared to the previous system. Automated data entry and software applications prevent many data entry errors, which is important to Honeywell because its maintenance data is included in its Six Sigma programs.

No Compromising Quality

These examples show that organizations don't have to sacrifice quality to improve speed in asset and maintenance management operations. Mobile computers, software applications and automated data capture provide strong return on investment because they simultaneously improve accuracy and productivity. Without ADC, new software applications provide faster access to bad information.

Possessing accurate, up-to-date information on parts and equipment is an important element of efficient maintenance. The aviation industry is a leader in procedures, standards and technology adoption for maintenance tracking, keeping records on billions of aircraft parts. The industry is a leader because it needs to be – each commercial jetliner has about 6 million parts. If lifetime duty cycles and maintenance histories for parts aren't available, regulations prohibit the plane from taking off. Most major airlines and MRO service providers use the Spec 2000 bar code standard as the foundation for lifetime parts identification, supported with automated data entry and computerized maintenance systems to create and manage accurate records.

Granted, we've all probably experienced a delayed flight while mechanics tended to a service issue. Overall, airline safety record is outstanding, and service organizations do an excellent job of keeping the complex assets available for flight.

2US Department of Energy – Federal Energy Management Program Operations and Maintenance Technology Report, July 2008, http://www1.eere.energy.gov/femp/operations_maintenance/

Other industries also benefit from lifetime tracking. The construction industry loses an estimated $1 billion annually to equipment theft from job sites, according to the National Equipment Register. Tool and equipment provider Bosch Power Tools is helping its customers reduce their losses by offering to embed a secure RFID tag within products it sells. Customers use the tamper-proof tag to automatically check items in and out of tool cribs. The system doesn't impose a heavy labor requirement to identify and record tool usage, which makes it practical to audit assets every day. Construction companies can quickly learn when tools go missing, which greatly improves the chances of recovery. Many hospitals have also implemented RFID and bar code systems to track their expensive medical equipment and help ensure it's where it needs to be in an emergency.

Environmental Impact

Independent studies have show that there are often correlations between energy consumption, asset performance and potential failures. For example, a decline in asset performance may be accompanied by an increase in energy consumption. By tracking energy consumption and emissions the information can be used as part of a preventive maintenance program to schedule maintenance, improve asset performance, prevent downtime and reduce energy consumption.

Reducing energy consumption is not only good for the environment, it can also result in significant cost savings in these days of rising energy costs. According to the VDC Advisory Group[3] it is estimated that over 60% of Operations and Maintenance (O&M) expenses are for energy alone and can be reduced up to 20% through monitoring and better maintenance.

Other asset related decisions can also have a green impact by reducing environmental impact and energy consumption. Tracking energy usage and doing benchmarking based on your EAM history can help you to identify problem assets. The information can then be used to justify replacing aging or inefficient assets, redesigning processes and procedures and even influencing new equipment design.

Conclusion

AIDC technologies are imperative for optimizing asset efficiency because they provide the real-time visibility and control that managers need to run their businesses on information, instead with excess labor, equipment or capacity. Return-on-Assets (RoA) has become an important measure of business value and competitiveness. Improving this metric requires organizations to step away from paper-based business as usual. Management processes need to be in place to track and manage assets, along with software applications and mobile data collection systems to provide the necessary information.

Resources

1. Stanley Steemer case study
2. We Energies case study
3. Raymond Handling Concepts case study

About Intermec

Intermec Inc. (NYSE:IN) develops, manufactures and integrates technologies that identify, track and manage supply chain assets. Core technologies include RFID, mobile computing and data collection systems, bar code printers and label media. The company's products and services are used by customers in many industries worldwide to improve the productivity, quality and responsiveness of business operations. For more information about Intermec, visit www.intermec.com or call 800-347-2636.

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3 ARC Solutions Group - Enterprise Asset Management Supports "Green" Initiatives, INSIGHT# 2008-25E JUNE 20, 2008, www.ARCweb.com

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